

The Micro Fence Ellipse Jig

12970 Branford Street Unit M, Arleta, CA 91331 Phone 1-800-480-6427
Email: microfence@microfence.com Website: www.microfence.com

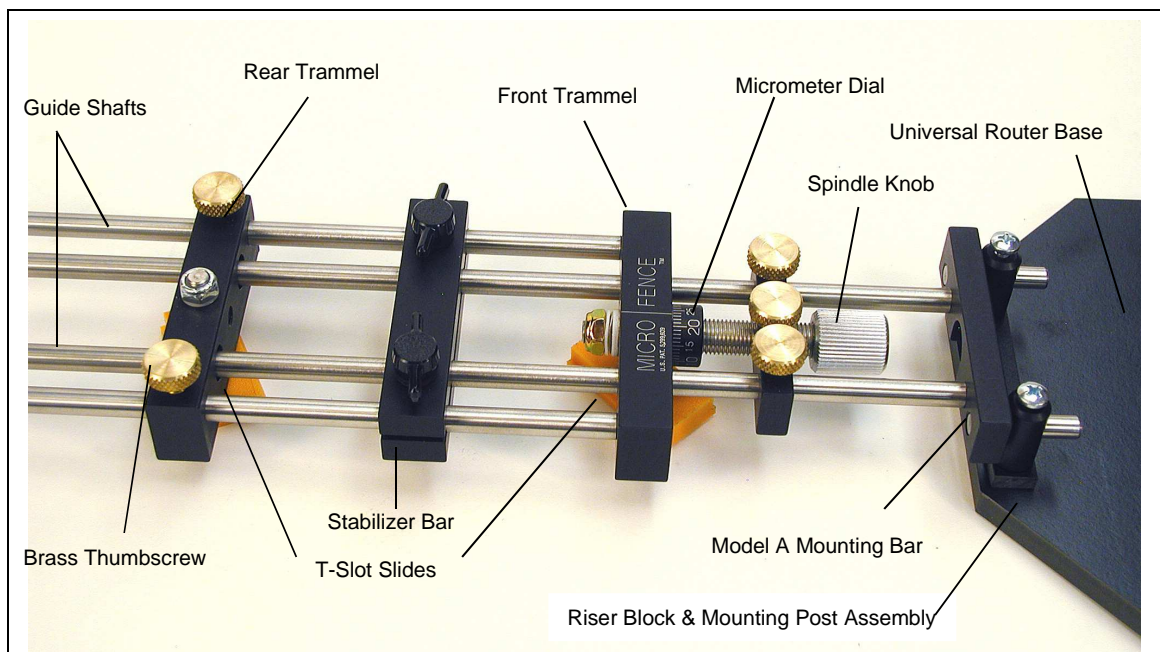
The ellipse is one of the most pleasing shapes in all of geometry and natural science. Described in academic terms as a section through a cone (not parallel to its base), we find the ellipse form in the orbits of the Earth around the Sun and the moon around the Earth. It would be hard to imagine a shape more natural in design or, unfortunately, more difficult to reproduce in material form.

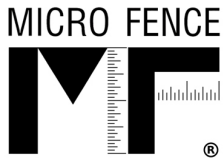
Ellipses and ovals are characterized by having two unequal axes: a **major** and a **minor**. The dimensional difference between these axes is called the **differential**. The drawing method used to generate the ellipse utilizes two centers, or foci. In general, the farther these two centers are placed apart, (creating a greater differential), the more elongated your ellipse will be. Conversely, the closer together they are placed, (the smaller the differential), the less elongated. Theoretically, if both centers were placed in the same position, the result would be a circle.

Micro Fence® addresses the task of making ovals and ellipses with what we hope you will find to be (pardon the pun) unparalleled results. The **Micro Fence®** Circle Jig, with its measuring capability and fine adjustment, offers some interesting and previously difficult to attain results in the making of these elongated shapes.

The two centers employed by your **Micro Fence®** Circle Jig can be placed at any distance apart between the limits of 1 7/8" and roughly 36", making it capable of a very wide range of elliptical shapes.

Our Standard Ellipse Jig kit includes all the basic parts you'll need to combine with your **Micro Fence®** Circle Jig to start making ovals and/or ellipses. (Please note that these kits require the **Micro Fence®** Model A Mounting Bar in conjunction with our **Circle Jig Attachment**). Our standard **Circle Jig** provides two sets of 12" stainless steel Guide Shafts (rods), providing up to a 24" reach when making circles or ellipses. Longer sets are available at 24" and 36"; see Figs. 1-4 on page 8 to determine the size and ellipse shape capability each of our models provide.





The Micro Fence Ellipse Jig

12970 Branford Street Unit M, Arleta, CA 91331 Phone 1-800-480-6427
Email: microfence@microfence.com Website: www.microfence.com

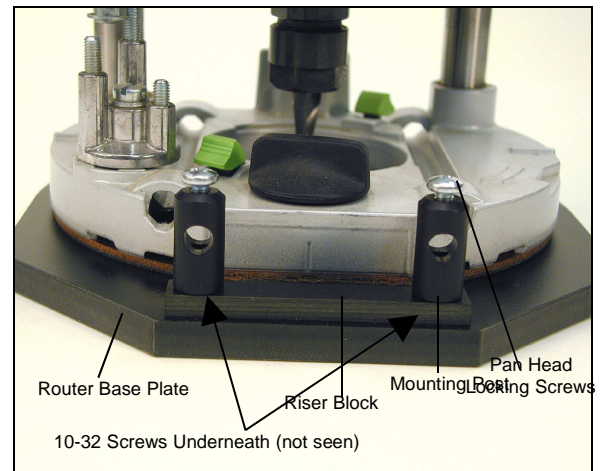
Instructions for Set-up and Operation:

Before you begin, be sure to verify that you have received all parts that are checked off on the packing list that is included with your Ellipse Jig.

Attaching Your Router to the Router Plate: Use your router's factory sub-base as a template to drill the Ellipse Jig Router Base screw holes. Center the bit opening of the sub-base from your router with the one in the Router Plate to locate the screw hole positions. Take care to keep the bottom, with the countersunk holes, facing downward to insure an accurate alignment. (If the holes in your router sub-base are not symmetrically placed, flipping the base can cause incorrect markings.) To protect the finish on your Router Plate, you can leave the protective plastic in place while you drill. Mark, drill, and countersink the Ellipse Jig Router Base to accommodate your router's screw requirements. Remove the protective plastic. (See the separate Universal Router Plate instruction page for further information.)

Assembling the Router Base Plate, Riser Block, & Mounting Posts:

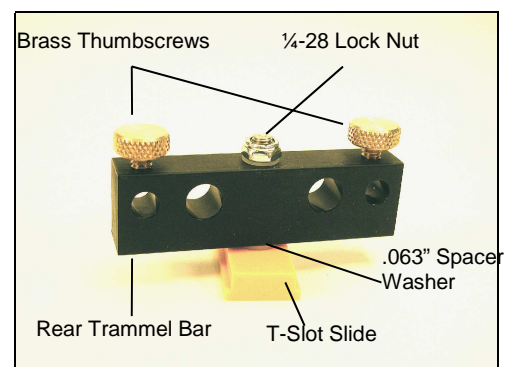
After removing the protective plastic from the plate, insert the 10-32 X 1 1/8" Flat Head Screws up through the bottom of the Router Base Plate and slide the 1/2 X 5/16 X 3" Riser Block over them. Thread on the two Mounting Posts above the Riser Block as shown and gently tighten them down, leaving them loose enough to turn with finger pressure. (You will firmly tighten all screws once the jig is assembled prior to actual use.)



Fitting the Circle Jig with Dovetailed Slide Blocks and Centers:

Install the Rear Center Post (1/4" X 1 5/8" Flat Head Bolt) through one of the T-Slot Slide Blocks. Install one the .063" spacer washers between the Slide Block and the Rear Trammel Bar. Install the nylon washer and 1/4-Lock Nut and tighten to a point that allows the slide block to rotate freely, but with as little play as possible.

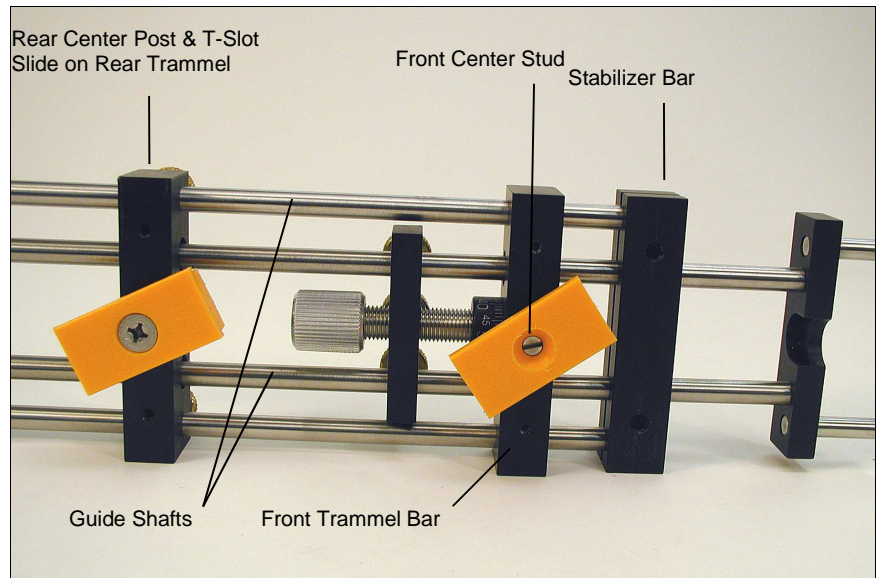
Once this assembly is completed, the rear trammel Assembly will be ready to slide onto the Guide Shafts.



of
28

Thread the Front Center Stud into the middle 6-32 hole on the bottom of the Front Trammel Bar. Tighten securely without over-tightening. Install the second .063" spacer washer.

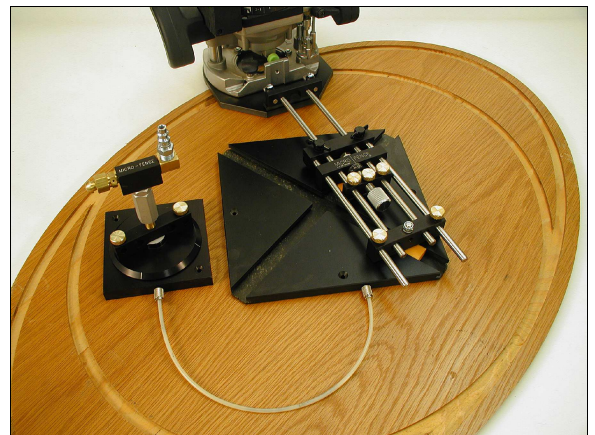
In the photo at the right, one of the common set-ups to make ellipses with the Circle Jig is shown, with both centers and a **Stabilizer Bar** installed.



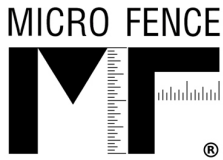
Attaching the Ellipse Axes Plate to the Work Surface:

Remove the protective plastic from the surface of the Axes Plate. Draw perpendicular axis lines on your work surface to use as a reference. Be sure these lines are at true 90 degrees to one another and long enough to extend beyond the edges of the axes plate. The Axes Plates are milled with notches to mark the centerlines of the dovetailed ways. Position the plate so that all four of the notches align with your 90 degree centerlines.

Fasten the plate to the work surface with appropriate length screws (we provide #10 X 1" pan head) to avoid penetrating the back side of your material. If you choose to work with two-sided tape to hold the axes plate in position, be sure to conduct suitable tests before beginning to cut your actual work piece.



Our **Ellipse Vacuum Kit** is available as an accessory to enable the Axes Plates to be held down by vacuum. Our **VCA** can be used as a remote vacuum generator to eliminate the need for screws or tape. See our website or catalog for more information.



The Micro Fence Ellipse Jig

12970 Branford Street Unit M, Arleta, CA 91331 Phone 1-800-480-6427
Email: microfence@microfence.com Website: www.microfence.com

Installing the Circle Jig in the Axes Plate:

We recommend a dry lubricant be applied to the axes plate before this assembly process. Our choice is Dynaglide, which can be purchased through **Micro Fence®**. Before attaching the Router Plate and router, you will need to install the Circle Jig in the Axes Plate. Slide the unattached T-Slot Slide Block into the T-Slot Track that is parallel to the major axis. (Install the .063" Spacer Washer between the T-Slot Slide and the Front Trammel Bar.)

This will become the seat for the Center Stud you installed in the middle hole on the bottom of the Front Trammel Bar. (See photo above.) Position the T-Slot Slide at the center of the Axes Plate and align the Circle Jig's Guide Shafts parallel to the minor axis. Slide the Rear Trammel Bar with the T-Slot Slide mounted under it onto the Guide Shafts and into the T-Slot Track. Set the differential at the desired distance and tighten all Brass Thumbscrews. As you turn the jig, both T-Slot Slides should travel smoothly along both axes.

Attaching the Router with Router Plate to the Ellipse Jig:

If all assembly to this point has been done properly, the Router Plate with your router mounted on it should slide right up and align with the pins of the Model A Mounting Bar. Insert the Mounting Pins into the Mounting Posts and firmly tighten the top Pan-head Locking screws.

At this point you should check the tightness of the 10-32 screws holding the Mounting Posts from the bottom of the router plate. To do this, loosen the Brass Thumbscrews and slide the Router Plate & mounting assembly out of the jig so that it can be turned upside down to check the screws. Firmly tighten and re-install. Your Ellipse Jig is now ready for use and should look like the photo on p.1. (Note: Insert the Mounting Pins all the way into the Mounting Posts. Photo license has been taken in the photos.)

Setting Your Ellipse Jig for The Size and Shape Ellipse You Wish to Make:

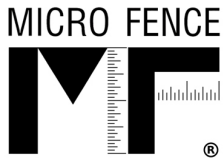
If you know what size ellipse you wish to make, that is if you know the major and minor axes dimensions, you can set up your **Micro Fence®** to accomplish it. The **major axis** dimension will be determined by positioning the bit at the required distance from the center post located in the Rear Trammel Bar. This setting will be the radius (one-half) of the major axis.

The **minor axis** dimension is determined by the position of the Front Trammel Center Stud and can be set by subtracting it from the major axis dimension, dividing it by 2 (halving it) and setting the differential at that distance. That will be the measurement between the two centers of your jig.* For example:

$$\begin{array}{rcl} \text{Major Axis} & = & 42'' \\ \text{Minor Axis} & = & - 32'' \\ \hline & & 10'' \text{ (divide by 2 for differential = 5'')} \end{array}$$

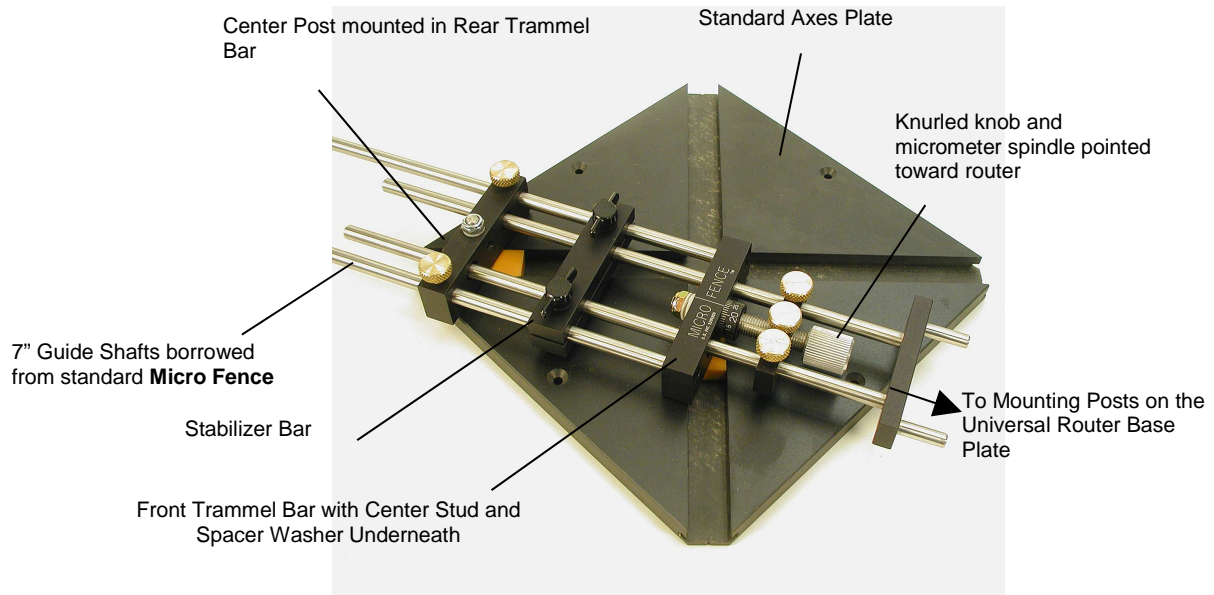
*(See differential measuring tip on p. 7)

Note: To provide the smallest differential settings, the **Micro Fence** Ellipse Jig should be positioned with the knurled knob of the Micrometer Spindle pointing toward the Router Plate (backwards from the way it comes from our factory). To accomplish this, unthread and remove the Guide Shafts and re-install them on the side opposite the spindle. When assembled in this fashion, it will appear as in the photo below.



The Micro Fence Ellipse Jig

12970 Branford Street Unit M, Arleta, CA 91331 Phone 1-800-480-6427
Email: microfence@microfence.com Website: www.microfence.com



Standard Axes Plate (9 1/4"): (Distances between centers from 1 7/8" to 5 1/2".)

Using the 9 1/4" plate along with the standard 12" Guide Shafts, differentials from 1 7/8" to 5 1/2" are possible. These factors allow ellipses from the smallest, at 19 3/4" X 23 1/2" using the 1 7/8" differential, (jig fully compressed) to 19 3/4" X 31 1/4" with the differential set at 5 1/2". (See Fig. 3).

Extending the 12" shafts out as far as possible, the large limits are 31 1/8" X 34 7/8" with the 1 7/8" differential and 31 1/8" X 42 5/8" using the 5 1/2" differential setting. (See Fig. 4)

Longer Guide Shafts:

We offer both 24" and 36" Guide Shafts as alternatives or additions to the standard 12" that come with the **Micro Fence®** Circle Jig. When installed, they add 24" and 48" respectively to the capacities shown in the drawings above.

With 24" rods (Guide Shafts) set at full extension, ellipses in Fig. 4, for instance, would measure 55 1/8" X 58 7/8" and 55 1/8" X 66 5/8". The 36" would produce shapes as large as 79 1/8" X 82 7/8" and 79 1/8" X 90 5/8".

We highly recommend the use of our **Stabilizer Bar(s)** when utilizing the longer Guide Shafts to add rigidity to the jig. (Included with our Standard Package)



For larger ellipses and especially those that require large differential settings (such as those required for transom windows or oval windows in entry doors), we offer T-Slot Track in 12", 24", and 48" lengths. These tracks come with both ends mitered and can be cut to any desired length to suit your project's requirements. Drawing accurate axes lines on your work will assist you in your set up. Take care to insure that these lines are drawn at true 90 degrees to one another and that they are marked clearly enough to be seen through the countersunk holes drilled along the centerline of the T-Slot track.

Install two pieces of track along the **major axis** by placing the tips of the mitered ends against each other and toward the center of your project. Align the holes drilled in the track with the center line drawn on your work. Use a long straight edge or another of the T-Slot Tracks to help keep the first two aligned. Note: A Vix Bit (self-centering pilot drill) can be an asset to help keep the screw straight and centered for this installation.

Note: We recommend that you utilize as many of the counter-sunk screw holes as possible to provide maximum rigidity for the slides.

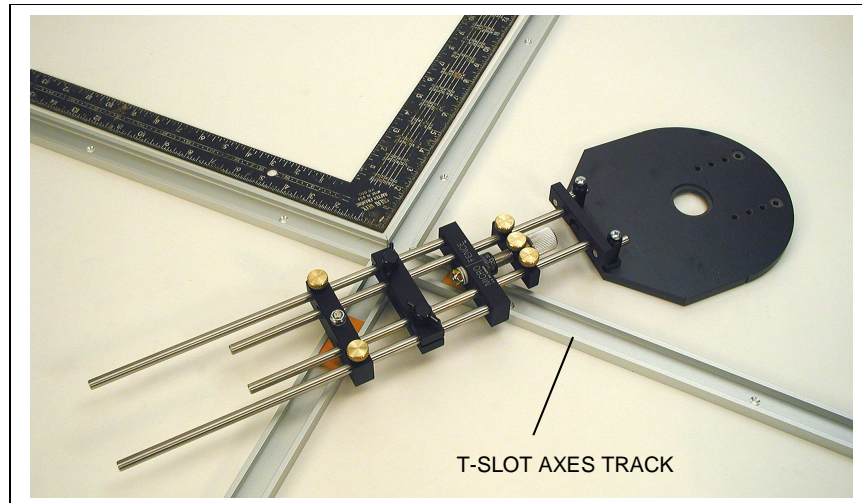
Using a square, attach the remaining two tracks to the work surface. The alignment at the center where the tracks meet is critical. Check to insure that there is no irregularity in track height. Shim to level if necessary.

Fit the **Micro Fence®** Circle Jig with the T-Slot Slide Block and both centers as described on page 2 above. With the Rear Trammel Bar assembly removed, position the Front Center in the Slide Block riding in the Major Axis Track. Slide the Rear Trammel Assembly into the Slide Block riding in the Minor Axis Track and fit the outside pair of Guide Shafts through the appropriate holes in the Trammel Bar. Adjust to the desired differential length and tighten the Brass Thumb Screws.

If you know the size of the ellipse you will be making, you can determine the length of track you will need by dividing the axis size by 2 and then deducting the distance from your router bit to the inboard side of your **Router Base Plate**. (This assembly will have to pass by the end of the track.) If you are not sure of the size ellipse you want to make, temporarily attach the track to the work surface in the manner described above and make a "dry run". Determine whether or not the tracks will need to be cut and then mark and cut them off at the appropriate length. Be sure to save all cut-offs for future use.

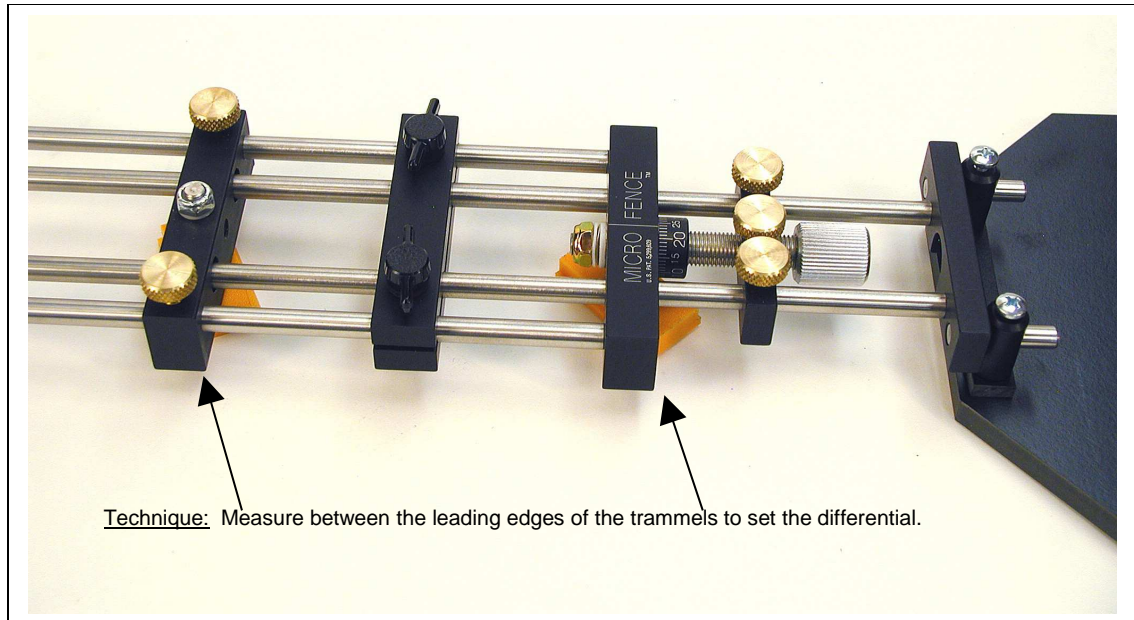
Note: When making ellipses with larger differentials (more elongated ones), it's likely that it will be necessary to remove a Minor Axis Track section during the cutting process to allow the router and plate to pass by. Once you have completed that section of the cut, replace the track and continue. Repeat on the opposite side.

Our optional **AXES TRACKS** are available in 12", 24", and 48" lengths for larger and/or more elongated ellipses. These can be cut to any length to customize your jig and provide differentials to 30" plus. We recommend our 4" T-Slot slides be used with the axes track for added rigidity.



Cutting Ellipses: Tips & Techniques:

- The success of your ellipse cutting will depend on your choice of router, the speed and feed of your cut execution as well as the rigidity of your **Micro Fence®** set-up, and your pre-cut planning. A little experimentation goes a long way toward understanding your set up, the character of the material you're working with, and the performance of your equipment. We encourage test cutting before each final application.
- Plan ahead for power cord management. A "dry run" before the cut may save costly errors. We recommend suspending the cord from above with a flexible tie or recruiting a second pair of hands to help during the actual cutting process.
- Our router bit recommendation is for an up, down, or compression spiral. Some spiral bits offer chip-breaker grinds that are desirable when cutting hardwoods or composite materials. Our favorite bits are made by the Onsrud Company and we carry them in solid carbide. We also advise a little spritz of dry lube, such as **Dynaglide** (our recommendation), on the router's sub-base to reduce friction and/or resistance.
- We highly recommend the use of our **Stabilizer Bar(s)** to add rigidity to your Circle/Ellipse Jig in any set up. Install them whenever possible to insure best results with our equipment.
- Our **Stop Collars** can be used with your Circle/Ellipse Jig to memorize a cut position or to pre-set a second cut position. (Cases in point might be concentric cuts such as those required when making curved moldings, when enlarging cuts to accommodate mating parts like inlays, or when cutting inside and outside diameters, e.g. rings.) These are available in sets of four from **Micro Fence®** and feature nylon-tipped set screws that won't harm the guide shafts when tightened down.
- Differentials (the distance between centers) can be measured from like edges of the front and rear trammel bars. (See photo below.)



Ellipse Axes Plate with Longer Rods:

24" Guide shafts: add 1' to the radii (2' overall)

36" Guide shafts: add 2' to the radii (4' overall)

STANDARD ELLIPSE AXES PLATE (9 1/4")

12" guide shafts; smallest and largest differentials.

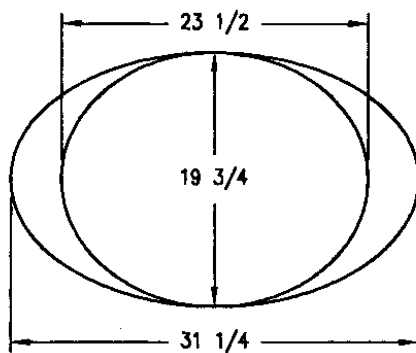


FIG 3

Jig fully compressed

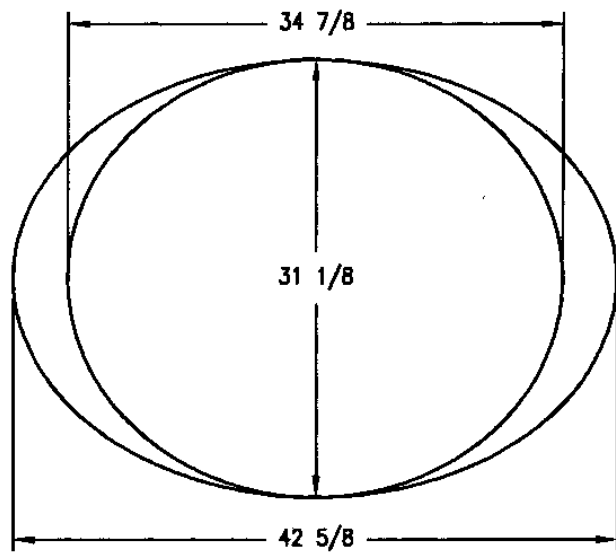


FIG 4

Jig fully extended